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FINAL REPORT

WINKLE MINE PROJECT
CUSTER COUNTY, MONTANA
MT A/E 86-46-107

NOVEMBER, 1986

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Helena, Montana 59624

FINAL REPORT

WINKLE MINE PROJECT
CUSTER COUNTY, MONTANA
MT A/E 86-46-107

NOVEMBER, 1986

Prepared for: MR. RICHARD JUNTUNEN, CHIEF
Abandoned Mine Reclamation
Bureau
Department of State Lands
1625 11th Avenue
Helena, MT 59620

Prepared by: L. C. HANSON COMPANY
Consulting Engineers
3108 McHugh Lane
PO Box 299
Helena, MT 59624

SANNA M. YOST, P.E.
Project Engineer

KEVIN M. REDMOND/DAVID A. McCLOY
Project Inspectors

L. C. HANSON COMPANY
CONSULTING ENGINEERS & SURVEYORS
HELENA — GREAT FALLS — GLENDIVE

FINAL REPORT

WINKLE MINE PROJECT

I. INTRODUCTION

A. Project Objectives

The WINKLE MINE reclamation work was undertaken to close mine openings, fill subsided and eroded areas, remove debris, halt extreme headcutting and erosion through the existing mine sites and to revegetate all disturbed areas including areas previously disturbed by coal mining and those resulting from the construction of this project.

B. History

The WINKLE MINE consists of two adjacent, small coal mines. The northern site is referred to as MINE 801 and the southern site is referred to as MINE 109. Both mines were small, shallow shaft "wagon mines" which served the needs of the local residents for winter fuel. Local informants reported that the operations at MINE 109 started around 1900 and continued until the 1930's. The mine eventually caught on fire which forced it to close. MINE 801 operated during the 1920's, 1930's and 1940's. After the shaft flooded during a flash flood, the underground mining ceased but a small stripping operation kept the mine operating for another couple of years until it closed in 1944. The operator/lessees for the mines were Matt Winkle, Virgil Miller, Harold Finke, Virgil Smith, and R. King.

C. Project Location

The WINKLE MINE project sites are located in the Pine Hills approximately 13.5 miles east of Miles City, Montana. MINE 801 is located in the southwest quarter of the northeast quarter of Section

14, Township 7 North, Range 49 East and MINE 109 is located approximately 1000 feet south of MINE 801 in the northwest quarter of the southeast quarter of Section 14, Township 7 North, Range 49 East. The land is currently owned by Jones Land and Livestock Company.

D. Site Description and Problems

The sites are located within the rolling, pine-covered terrain of the Pine Hills. Both sites are at the head of gullies which form the upper drainages of Chimney Creek. Vegetation consists of range grasses, cactus, sagebrush, Rhus, cottonwood trees and ponderosa pines. The soil is an unstable material consisting of a very loose, loamy sand.

MINE 801 consisted of an excavated area surrounded by steep unstable banks. The drainages going into the excavated area were severely eroding and were actively headcutting upstream in two areas. The head cuts were both about 18 feet deep, ranged from 15 to 30 feet wide and were 350 feet and 60 feet in length. A small earth dam in the streambottom downstream of the site contained the runoff. One hazardous shaft approximately 6 feet in diameter and 150 feet deep partially covered with rotting timbers existed at this site. A partially-collapsed adit also existed at the site as well as five collapsed dugouts, possibly used as storage structures, filled with rotting timbers and debris. Metal debris at the site consisted of remains of old machinery parts, a barrel, bed frames, and pieces of sheet metal. Partially-collapsed structures at this site consisted of a shed and what may have once been an old tipple. Wooden planks and timbers were scattered throughout the entire site.

MINE 109 consisted of a large excavated area with six major subsidence holes and a burning coal slack pile. Again due to the unstable nature of the soil, the disturbed areas at MINE 109 were actively eroding.

The construction limits encompassed approximately 2.0 acres at MINE 801 and 2.3 acres at MINE 109.

II. DESCRIPTION OF RECLAMATION PROJECT

A. Project Planning

The major items of work for this project were 1) to eliminate safety hazards by the backfilling and/or regrading of subsidence features and hazards created by erosion of the mining sites and 2) to excavate, extinguish and bury burning coal waste piles and outcrops. The elimination of subsidence features and deeply-eroded gullies will allow the land to be placed back into agricultural use. Extinguishing and burial of the burning coal waste materials and outcrops reduced the probabilities of future range fires created from the exposed burning coal located here.

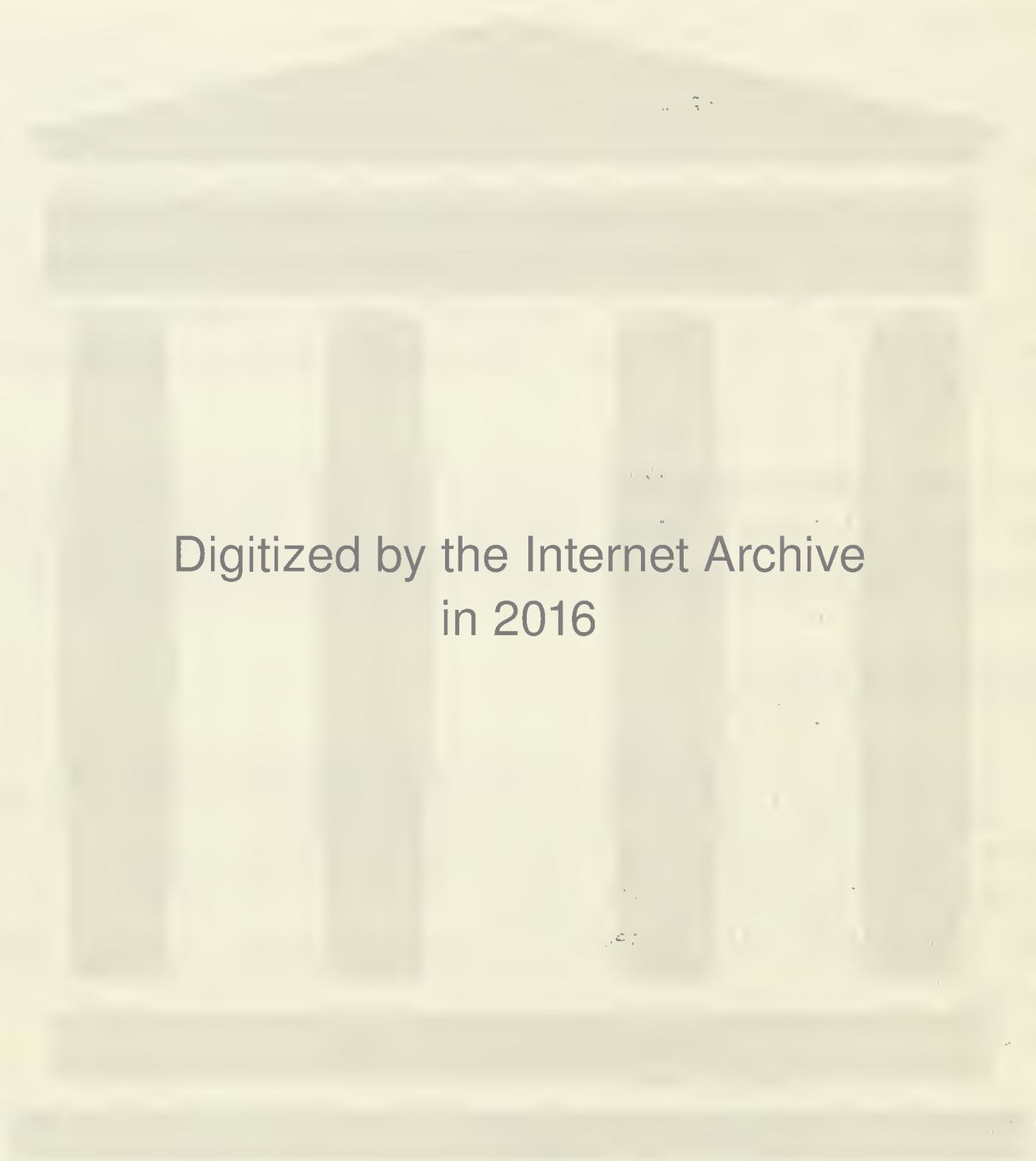
Sanna Yost was the Project Engineer on this project, Lowell Hanson was the Project Manager, Kevin Redmond was the Project Construction Inspector and David McCloy was the seeding and fertilizing Inspector.

B. Chronological History

1. The project was advertised for the three consecutive weeks of June 13, 1986, June 20, 1986 and June 27, 1986.
2. The Pre-Bid Conference was held on-site on June 18, 1986.
3. Bids were opened on July 3, 1986.
4. The Agreement was signed and the Contract awarded on July 20, 1986 to:

L.P. ANDERSON CONTRACTOR, INC.
PO Box 1106
Glendive, MT 59330

5. The Pre-Construction meeting was held on August 6, 1986.
6. Contract time started August 6, 1986.
7. All work, with the exception of revegetation work, was completed on August 30, 1986.
8. A Temporary Shutdown Order was issued effective August 30, 1986.



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9. A Resume Work Order was issued effective October 13, 1986.
10. Revegetation work was completed on October 15, 1986. (The Contractor used 27 of the 45-day Contract).
11. Final Inspection by the Owner was completed on October 27, 1986.

C. Equipment

1. Terex Scraper TS 14B - 14 C.Y.
2. Cat D6 Dozer
3. Bantum Backhoe C415 w/1 C.Y. bucket
4. Terex 72-51 Front-End Loader w/4 C.Y. bucket.
5. 2400 Gal Water Tank on Dump Truck w/Spreader bar
6. 3600 Gal Water Tank on Dump Truck
7. Whacker (hand tamper)
8. Pump w/2" discharge hose and nozzle
9. Mulch Spreader and Tucker
10. 9680 Lilliston Seed Drill
11. MM 61000 Tractor
12. Cat D5 Dozer

D. Construction Operations

Darrell R. Austby was designated as the Contractor's on-site superintendent. Hininger Drilling company was the seed, fertilizer and mulching subcontractor. The fencing subcontractors were Bud Peterson and Wayne Rolfe, the lessees. The crew worked 10-hour days from 7:00 A.M. to 5:30 P.M., Monday through Thursday. The construction of this project was accomplished as follows:

- August 6, 1986 - Moved in equipment
- Set up sanitary facilities
 - Pre-construction meeting
 - Discussed Work Directive #1
 - Installed gate in existing fence on access road to MINE 109

- Removed and stockpiled topsoil at MINE 801

August 7, 1986 - Closed mine openings, shaft and adit, at MINE 801

- Debris cleanup MINE 801 (Wayne Rolfe, lessee, wanted old loader bucket salvaged and hauled it to his home. The Contractor used lessee Bud Peterson's private landfill for debris disposal. No debris was burned or left on site)
- Backfill subsidence holes MINE 801
(Landowner requested change in fence alignment MINE 109 - eliminated 1 gate)

August 11 and

August 12, 1986 - Regraded susided areas MINE 801 ($\pm$ 4:1 slopes)

- (Ground extremely dry and loose sand hard to compact. 45-minute haul for water. Began using a second water truck)
- Issued Work Directive #1

August 13, 1986 - Installed and backfilled pipe drop structure MINE 801

- Constructed drainage control embankment for pipe drop structure MINE 801
- (1/2" rainfall helped compaction efforts)

August 14, 1986 - Replaced topsoil MINE 801

- Clean up debris MINE 109
- Salvaged and stockpiled topsoil MINE 109

August 18, 1986 - Excavated haulways for waste pile disposal MINE 109

- Disposed of waste pile
- Watered waste pile (waste pile not currently burning however ashes indicated burning in recent past. Inspector requested Contractor use method other than flooding and mixing w/D6 Dozer as was using 28 gal/c.y. and too wet)

- August 19, 1986 – Regraded waste pile area MINE 109
– Regraded subsided area MINE 109 ($\pm$ 3:1 slopes)
- August 20, 1986 – Fencing MINE 801
– Continued subsidence grading MINE 109
– (noted need for additional riprap at outlet of drop structure MINE 801)
- August 21, 1986 – Continued subsidence grading MINE 109
– Fencing MINE 801 and 109
– Discovered burning coal seam at toe of slope MINE 109
- August 22, 1986 – No work. Inspector investigated burning coal seam MINE 109
- August 25, 1986 – Completed fencing
– (Contractor requested increase to \$48/Mgal to provide water for remaining additional work)
– (Issued Work Directives #2 and #3)
– Work Directive #2
- August 26, 1986 – Work Directive #2 (Inspector installed 3 temperature probes in burn area: #1 81° F, #2 72° F, #3 82° F)
- August 27, 1986 – Mulching MINE 801
– Completed Work Directive #2 MINE 109
– Completed Work Directive #3.1 MINE 801
- August 28, 1986 – Constructed drainage control embankment and pipe outlet structure MINE 109
– Replaced topsoil MINE 109
– Completed mulching MINE 801

August 29, 1986 - Mulching MINE 109

- Cleaned up site and demobilized equipment
- Seedbed preparation of access roads
- STORM KING MAINTENANCE: Work Directive #3.2

August 30, 1986 - Completed mulching MINE 109

- Installed Owner-provided signs

October 14, 1986 - Seeded and fertilized MINE 109

October 15, 1986 - Seeded and fertilized MINE 801

- Seeded and fertilized STORM KING MAINTENANCE.
(Work Directive #3.2)

III. COST SUMMARY

A. Change Orders

The following Work Directives and Change Orders were executed during the course of the project:

Work Directive #1 - Excavate, remove and extinguish burning coal seam by gate MINE 109. Issued 8-11-86.

Work Directive #2 - Excavate, remove and extinguish extensive burning coal seam 10'x10'x20' deep at toe of slope MINE 109. Once extinguished the area was sealed with a clay material and covered with 4 feet of soil. Issued 8-25-86.

Work Directive #3 - 1) Additional riprap at outlet of pipe drop structure MINE 801
- 2) STORM KING MINE; replace topsoil on previously disturbed area. Seed and fertilize.
Issued 8-25-86.

Change Order No. 1 - Included Contract increase to cover work done under Work Directive #1.

Change Order No. 2 - Included Contract increases to cover work done under Work Directives #2 and #3 and to increase unit price for water provided after 8-25-86 to \$48/MGal.

B. Final Payment Request and Reconciliation Change Orders

A copy of the Final Payment Request and the Reconciliation Change Orders (Contract Change Orders #3 and #4) are contained in Appendix A of this report. These documents summarize the final quantities and costs for each work item.

C. Costs Per Site/Unit

1. Total Project Cost	\$ 40,517.05	
2. Cost per site		
A. MINE 801 site	17,165.78	
B. MINE 109 site	23,176.27	
C. STORM KING MINE site	175.00	
3. Cost per acre (disturbed area)		
A. Total (4.3 acres)	\$ 9,422.57	$\frac{40,517.05}{4.3}$
B. MINE 801 site (2.0 acres)	8,582.89	$\frac{17,165.78}{2.0}$
C. MINE 109 site (2.3 acres)	10,076.64	$\frac{23,176.27}{2.3}$
C. STORM KING site (0.10 acre)	1,750.00/Acre	$\frac{175.00}{.10}$
4. Cost per acre per work item		
A. MINE 801 (2.0 acres)		
1. Debris Cleanup	\$ 250.00	
2. Salvage & Replace Topsoil	1,414.70	
3. Close Mine Opening - Adit	250.00	
4. Close Mine Opening - Shaft	250.00	

5. Subsidence Backfill	500.00
6. Subsidence Grading	1,415.00
7. Provide Water	648.00
8. Fertilizer	96.51
9. Seed	325.82
10. Mulch	1,234.77
11. Farm Fence	546.35
12. Single Panel	120.00
13. Double Panel	250.00
14. F-3 Gate	20.00
15. Drainage Control Structure (includes Work Directive #3.1)	761.75

8082.9

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16465.79

B. MINE 109 (2.3 acres)

1. Debris Cleanup	\$ 217.39
2. Salvage & Replace Topsoil	1,135.15
3. Burning Coal Slack Disposal (includes Work Directives #1 and #2)	2,481.74
4. Provide Water (includes Change Order #3.2)	1,915.83
5. Fertilizer	96.51
6. Seed	325.82
7. Mulch	1,234.77
8. Farm Fence	475.09
9. Single Panel	104.35
10. Double Panel	260.87
11. F-3 Gate	17.39
12. Drainage Control Structure	416.09

8681.00

IV. SUMMARY

A. Completed Reclamation

The Contract allowed the Contractor 45 calendar days to complete the project work. He used 27 calendar days or 60% of the Contract

time and actually completed the work in 18 working days.

The project resulted in complete disposal of the existing coal slack waste pile at MINE 109 and in the discovery and subsequent excavation, extinguishing and sealing of two additional actively burning coal outcrops at that site. The drainage control embankment and outlet pipe works at MINE 109 will prevent future headcutting from occurring at this site as well as preventing the downstream migration of sediment from the site.

Filling the air shaft, the adit, and the deeply-eroded gullies at MINE 801 removed the hazards at that site. The drainage control embankment and pipe drop structure with riprapped outlet will ensure the safe passage of runoff waters across the easily-eroded slopes and will prevent future headcuts from developing.

Filling the subsided areas, topsoiling and revegetation work at the MINE 801 and MINE 109 sites and at the previously-disturbed area at the STORM KING MINE site has aesthetically restored all of the sites to their previous use. The project has resulted in the elimination of health and safety hazards that existed previously and will protect the sites against future degradation due to stormwater runoff.

B. Comments

The Contractor completed the work as specified. His equipment was generally well-maintained and efficiently used. It would be recommended to use a spraying method of water application for compaction, backfill, and grading in steep areas and areas where the soil is extremely sandy, loose and easily eroded. Also, spraying topsoil stockpiles prior to resspreading in this type of soil and terrain is recommended.

The burn areas at MINE 109 will require monitoring over the next

several years to insure that the fire is under control. Use the three temperature probes installed during the construction of this project to monitor temperatures of the underground coal seam. The temperatures should show a long-term cooling trend.

Monitoring of the steep slopes at both sites will be required to observe the revegetation work. The drainage control structures should be inspected on an annual basis and maintained as necessary to insure clear passageways. It is possible that future maintenance will be required if erosion occurs before the vegetation takes hold.

On projects with long haul distances for water it may be beneficial to require larger capacity water trucks or require that the Contractor have the capability of hauling a given quantity of gallons per hour.

V. SLIDES

The Slide Logs and Slides are contained in Appendix B.

APPENDIX A

Payment Request No. 2
Final

From: August 30, 1986

To: October 15, 1986

Project Name: Winkle Mine Project

Location: Custer Co. Mt.

Project No.: Mont A/E 86-46-107

Name Of Contractor: L.P. Anderson Contr. Address: PO Box 1106 Glendive, Mt 593

Summary Of Project Status

Amount of Original Contract	\$32,337.00
Amount of Approved Change Order(s)	8,180.05
TOTAL CONTRACT AMOUNT	40,517.05
Contract Time Used to Date	27 Days
Percentage of Contract Time Used	60%
Percentage of Contract Amount Earned	100%

Original Contract Amount Completed	32,337.00
Change Order(s) Amount Completed	8,180.05
Amount for Materials On Site	0.00
TOTAL To Date	40,517.05
Times 90% =	No Retainage
TOTAL AMOUNT Earned To Date	40,517.05
Less Previous Amount Earned	34798.55
Amount Payable This Period	5,718.50
Less 1% Gross Receipts Tax	57.19
TOTAL DUE CONTRACTOR THIS PERIOD	\$5,661.32

Requested By: L.P. Anderson Contr. James J. Morrison Date: 11-8-86
(Contractor)

Checked By: L.C. Hanson Co. Sarwa M. Yost Date: 11-18-86
(Engineer)

Approved By: Department of State Lands Robert J. Smith Date: 11/19/86
Abandoned Mine Reclamation Bureau (Owner)

PAY REQUEST NO. 2

L.C. Larson Co.

STREET & Main Mine Project

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Page 2 of 4

ITEMIZATION OF QUANTITIES AND COSTS

ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITY	UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMP.
1	Mobilization	1.0 Lump	2000.00	0.00	1.00	2000.00	100*
2	Debris Cleanup	1.0 Lump	1000.00	0.00	1.00	1000.00	100*
3	Salv. & Repl. Topsoil 109	1130.0 C.Y.	2.35	0.00	1111.00	2610.85	100*
4	Salv. & Repl. Topsoil 801	890.0 C.Y.	2.35	0.00	1204.00	2829.40	100*
5	Close Mine Opening - Adit	1.0 Ea.	500.00	0.00	1.00	500.00	100*
6	Close Mine Open-Air Shaft	1.0 Ea.	500.00	0.00	1.00	500.00	100*
7	Burning Coal Slack Disp.	1.0 Lump	2600.00	0.00	1.00	2600.00	100*
8	Subsidence Backfill	1.0 Lump	1000.00	0.00	1.00	1000.00	100*
9	Subsidence Grading M(109)	1.0 Lump	2210.00	0.00	1.00	2210.00	100*
10	Subsidence Grading M(801)	1.0 Lump	2830.00	0.00	1.00	2830.00	100*
11	Provide Water	85.0 MGal.	30.00	0.00	158.40	4752.00	100*
12	Fertilizer	380.0 lbs.	1.00	415.00	415.00	415.00	100*
13	Seed	86.0 lbs.	15.00	93.40	93.40	1401.00	100*
14	Vegetative Mulch	12300.0 lbs.	0.35	0.00	15170.00	5309.50	100*
15	Farm Fence - F3M	2910.0 L.F.	0.70	0.00	3122.00	2185.40	100*
16	Single Panel	8.0 Ea.	80.00	0.00	6.00	480.00	100*
	Sub-Total					32627.15	

Work completed on this item

L. C. Hays Co.

Page 3 of 4

[illegible]

work completed on this item

L.C. Hanson Co.

MCNT A, E 66-46-107

Page 4 of 4

ITEMIZATION OF QUANTITIES AND COSTS

Work completed on this item

SECTION II

2.12 CHANGE ORDER

Order No.

3

Date: September 2, 1986

Agreement Date: July 20, 1986

NAME OF PROJECT: WINKLE MINE PROJECT

Custer County, MT MONTANA A/E 86-46-107

OWNER: State of Montana, Department of State Lands

CONTRACTOR: L. P. Anderson Contractor, Inc.

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
	(SEE ATTACHED SHEET)						
TOTAL COST - MAT'LS, LABOR, EQUIPMENT & MISC.					\$ 3,648.15		
OVERHEAD & PROFIT @ _____ %					(Incl. above)		
GRAND TOTAL - THIS CHANGE ORDER					3,648.15		

Original Contract Price

\$32,337.00

Current Contract Price Adjusted by Previous Change Order

36,722.90

Cost This Change Order (+ or -)

3,648.15

New Contract Price Including This Change Order

\$40,371.05

The completion date as set forth in the Contract Documents shall be (unchanged, increased, decreased) by 0 calendar days.

The date for completion of all work will be September 24, 1986.

Description and Justification for Change:

1. Bid Item 3 and 4 - Variations in depth of existing topsoil throughout project site.
Bid Item 3 and 4 - Additional water was needed to extinguish the two additional burning coal seams not included in the original Contract.
- Bid Item 14 - An application rate of 3,700 pounds per acre was needed to complete an adequate mulching job in the light silty soils at the project site (attached copy of Inspector's Log for August 27, 29 and 30, 1986)
- Bid Items 15, 16, 17, 18 - The alignment of the fence was changed as per the landowner's request. This added 212 L.F. of fence but eliminated 2 single panels, 2 double panels, and one gate.

SURETY CONSENT

The surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bond or Bonds is hereby increased by Three Thousand Six Hundred Forty Eight and 15/100 (\$ 3,648.15) (One hundred percent (100%) of the Change Order amount) and the penalty of the applicable Payment Bond or Bonds is hereby increased by Three Thousand Six Hundred Forty Eight and 15/100 (\$ 3,648.15) (One hundred percent (100%) of the Change Order amount).

COUNTERSIGNED BY MONTANA RESIDENT AGENT

W. A. MITCHELL AGENCY

SURETY

UNITED STATES FIDELITY & GUARANTY CO.,

BY: [Signature]

(Seal)

Recommended by: L. C. Hanson Company [Signature], Engineer

Accepted by: [Signature], Contractor

Approved by: [Signature], Owner

Change Order No. 3
WINKLE MINE PROJECT
Custer County, MT
MONTANA A/E 86-46-107

QUANTITY VARIATIONS ON WORK ITEMS COMPLETED AS OF AUGUST 30, 1986

ITEM NO.	DESCRIPTION OF CHANGES-EST. QUANTITIES & UNITS	EST.	COST OF CHANGES		UNIT	CONTRACT UNIT COST	TOTAL COST
			ACTUAL	DIFFERENCE			
3.	SALV & REPLACE TOPSOIL (MINE 109)	1113	1111	- 19	C.Y.	2.35	- 44.65
4.	SALV & REPLACE TOPSOIL (MINE 801)	890	1204	+314	C.Y.	2.35	+ 737.90
11.	PROVIDE WATER	85	158.4	+73.4	MGAL	30.00	+ 2202.00
14.	VEGETATIVE MULCH	12300	15170	+2870	LBS	0.35	+ 1004.50
15.	FARM FENCE - F3M	2910	3122	+212	L.F.	0.70	+ 148.40
16.	SINGLE PANEL	8	6	-2	EACH	80.00	- 160.00
17.	DOUBLE PANEL	13	11	-2	EACH	100.00	- 200.00
18.	F-3 GATE	48	32	-16	L.F.	2.50	- 40.00
TOTAL							<u>+\$3648.15</u>

SECTION II

2.12 CHANGE ORDER

Order No. 4Date: October 29, 1986Agreement Date: July 20, 1986NAME OF PROJECT: WINKLE MINE PROJECTCuster County, MT MT A/E 86-46-107OWNER: Montana Department of State LandsCONTRACTOR: L. P. Anderson Contractor, Inc.

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
	(SEE ATTACHED SHEET)						
TOTAL COST - MAT'LS, LABOR, EQUIPMENT & MISC.					\$ 146.00		
OVERHEAD & PROFIT @ _____ %					(Included above)		
GRAND TOTAL - THIS CHANGE ORDER					\$ 146.00		

Original Contract Price	\$ 32,337.00
Current Contract Price Adjusted by Previous Change Order	40,371.05
Cost This Change Order (+ or -)	+ 146.00
New Contract Price Including This Change Order	\$ 40,517.05

The completion date as set forth in the Contract Documents shall be (unchanged, increased, decreased) by 0 calendar days.

The date for completion of all work will be October 15, 1966.

Description and Justification for Change:

1. Bid Item 12 and 13 - 4.3 acres were fertilized and seeded. Fertilizer was applied at a rate of 96.5 lb of nutrients per acre. Seed was applied slightly higher than the required rate of 21.0 lb. of PLS per acre due to bulk seed quantities provided, however, the amount is less than the 10% overrun allowed by the Contract.

SURETY CONSENT

The surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bond or Bonds is hereby increased by One Hundred Forty Six Dollars and NO/100

(\$ 146.00) (One hundred percent (100%) of the Change Order amount) and the penalty of the applicable Payment Bond or Bonds is hereby increased by One
Hundred Forty Six Dollars and NO/100 (\$ 146.00)
(One hundred percent (100%) of the Change Order amount).

COUNTERSIGNED BY MONTANA RESIDENT AGENT

W. A. MATCHER AGENCY
[Signature]

SURETY

UNITED STATES FIDELITY & GUARANTY CO.
BY: [Signature]
(Seal)

Recommended by: L. C. Hanson Company Sanna M. Yost, Engineer

Accepted by: L. B. Anderson Contractor Inc by Henry J. Morris, Contractor

Approved by: [Signature], Owner

Change Order No. 4
WINKLE MINE PROJECT
Custer County, Montana
MT A/E 35-46-107

QUANTITY VARIATIONS ON WORK ITEMS COMPLETED AS OF OCTOBER 15, 1986 - FINAL

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES QUANTITY			UNIT	CONTRACT	
		ESTIMATED	ACTUAL	DIFFERENCE		UNIT COST	TOTAL COST
12.	FERTILIZER	380.0	415.0	+ 35.0	LBS.	1.00	+\$ 35.00
13.	SEED	86	93.4	+ 7.4	LBS	15.00	<u>+ 111.00</u>
TOTAL							<u><u>+\$146.00</u></u>

APPENDIX B

SLIDE LOG

WINKLE MINE PROJECT

1. 8-6-86 Mine 109 - Preconstruction conditions.
2. 8-6-86 Mine 109 - Preconstruction conditions.
3. 8-6-86 Mine 109 - Preconstruction conditions.
4. 8-6-86 Mine 109 - Preconstruction conditions.
5. 8-6-86 Mine 109 - Aerial photo.
6. 8-6-86 Both sites - Aerial photo.
7. 8-6-86 Both sites - Aerial photo.
8. 8-6-86 Mine 801 - Aerial photo.
9. 8-6-86 Mine 801 - Aerial photo.
10. 8-7-86 Mine 801 - Almost preconstruction conditions.
11. 8-7-86 Mine 801 - Almost preconstruction conditions.
12. 8-7-86 Mine 801 - Almost preconstruction conditions.
13. 8-7-86 Mine 109 - Preconstruction conditions.
14. 8-7-86 Mine 801 - Topsoil removal w/Cat D6.
15. 8-7-86 Mine 801 - Eroded drainage.
16. 8-7-86 Mine 801 - Eroded drainage.
17. 8-7-86 Mine 801 - Adit opening.
18. 8-7-86 Mine 801 - Filling air shaft, grading operations.
19. 8-7-86 Mine 801 - Grading operations.
20. 8-7-86 Mine 801 - Filling air shaft.
21. 8-7-86 Mine 801 - Grading operations.
22. 8-11-86 Mine 801 - Overall view prior to grading.
23. 8-11-86 Mine 801 - Overall view prior to grading.
24. 8-11-86 Mine 801 - Looking down headcut prior to grading.

25. 8-12-86 Mine 801 - Drainage control structure: cutoff collar.
26. 8-12-86 Mine 801 - Drainage control structure: looking upstream.
27. 8-12-86 Mine 801 - Drainage control structure: looking upstream.
28. 8-12-86 Mine 801 - Drainage control structure: looking upstream.
29. 8-13-86 Mine 801 - Drainage control structure: looking upstream.
30. 8-13-86 Mine 801 - Drainage control structure: Whacker.
31. 8-13-86 Mine 801 - Drainage control structure: Whacker.
32. 8-14-86 Mine 801 - Drainage control structure.
33. 8-14-86 Mine 801 - Subsidence grading area.
34. 8-18-86 Mine 109 - Stripping topsoil.
35. 8-18-86 Mine 109 - Building access road.
36. 8-18-86 Mine 109 - Topsoil pile w/scrapper.
37. 8-18-86 Mine 109 - General shot after soil removed.
38. 8-19-86 Mine 109 - Pulling water truck up hill.
39. 8-19-86 Mine 109 - Coal slack waste pile removal w/scrapper.
40. 8-19-86 Mine 109 - Spraying water from top.
41. 8-19-86 Mine 109 - Additional area of burning coal seam. Work Directive #1.
42. 8-19-86 Mine 109 - Burning coal. Work Directive #1.
43. 8-10-86 Mine 109 - General grading.
44. 8-20-86 Mine 109 - General grading.
45. 8-20-86 Mine 109 - General grading.
46. 8-20-86 Mine 109 - General grading, water application.
47. 8-10-86 Mine 109 - Completed burning coal area.
48. 8-20-86 Mine 109 - Completed burning coal area.
49. 8-21-86 Mine 109 - Putting finish on grading.
50. 8-21-86 Mine 109 - Removing access road.

51. 8-21-86 Mine 109 - Burning coal seam: excavation.
52. 8-21-86 Mine 109 - Burning coal seam: excavation.
53. 8-25-81 Mine 109 - Burning coal seam: extinguishing. Work Directive #2.
54. 8-25-86 Mine 109 - Burning coal seam: extinguishing. Work Directive #2.
55. 8-25-86 Mine 109 - Burning coal seam: extinguishing. Work Directive #2.
56. 8-25-86 Mine 109 - Burning coal seam: extinguishing. Work Directive #2.
57. 8-25-86 Mine 109 - Burning coal seam: extinguishing. Work Directive #2.
58. 8-26-86 Mine 109 - Burning coal seam - Placing fill in trench. Work Directive #2.
59. 8-26-86 Mine 109 - Burning coal seam - Placing fill in trench. Work Directive #2.
60. 8-26-86 Mine 109 - Burning coal seam - Placing fill in trench. Work Directive #2.
61. 8-26-86 Mine 109 - Fencing - cleaning out holes.
62. 8-26-86 Mine 109 - Fencing - Drilling holes.
63. 8-26-86 Mine 109 - Trench for burning coal disposal. Work Directive #2.
64. 8-27-86 Mine 109 - Trench for burning coal disposal. Work Directive #2.
65. 8-27-86 Mine 109 - Water truck extinguishing burning coal. Work Directive #2.
66. 8-27-86 Mine 109 - Water truck extinguishing burning coal. Work Directive #2.
67. 8-27-86 Mine 109 - Water truck extinguishing burning coal. Work Directive #2.
68. 8-27-86 Mine 109 - Trenching and extinguishing burning coal. Work Directive #2.
69. 8-27-86 Mine 109 - Trenching and extinguishing burning coal. Work Directive #2.
70. 8-28-86 Mine 109 - Work on drainage control structure: outlet pipe.
71. 8-28-86 Mine 109 - Work on drainage control structure: outlet pipe.
72. 8-28-86 Mine 109 - Working on drainage control structure: outlet pipe.
73. 8-28-86 Mine 109 - Installation of cutoff collar.
74. 8-28-86 Mine 109 - Outlet pipe prior to backfill.
75. 8-29-86 Mine 801 - View looking south.
76. 8-29-86 Mine 109 - Mulching activities.
77. 8-29-86 Mine 109 - Mulching activities.

- 78. 8-29-86 Mine 109 - Mulching activities.
- 79. 8-29-86 Mine 109 - Mulching activities.
- 80. 8-29-86 Mine 109 - Mulching activities.
- 81. 8-29-86 Mine 109 - Mulching activities.
- 82. 8-29-86 Mine 109 - Mulching activities.
- 83. 8-29-86 Mine 109 - Trash rack.
- 84. 8-29-86 Mine 109 - Mulch on dike.
- 85. 8-29-86 Mine 801 - Overview at completion.
- 86. 8-29-86 Mine 801 - Overview at completion.
- 87. 8-29-86 Mine 801 - Overview at completion.
- 88. 8-29-86 Mine 801 - Overview at completion.
- 89. 8-29-86 Mine 801 - Overview at completion.

APPENDIX C

ANALYSIS OF PROFESSIONAL SERVICE FEES
DATE OF PREPARATION: December 12, 1986
PROJECT: Winkle

PROFESSIONAL SERVICE AMOUNT

* Data Gathering, Site Evaluation, Preliminary Engineering, Final Engineering, Bidding Documents	\$19,204.83
* Construction Administration, Construction Inspection, Final Report Preparation	\$11,012.61

L.C. HANSON CO. COSTS	----- \$30,217.44 -----
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CONSTRUCTION COSTS	----- \$40,517.05 -----
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PERCENTAGE ANALYSIS

PRE-CONST. LCH CO COST/CONSTRUCTION COST	47.40%
CONST. & POST CONST. LCH CO. COST/CONSTRUCTION COST	27.18%
TOTAL LCH CO. COST/CONSTRUCTION COST	74.58%

REMARKS: Services provided include lien determination, landowner consent, budget preparation, grant application, weed board approval, basic engineering, construction staking, contract administration, quantity accounting and full time resident inspection. The project involved two sites with diverse reclamation requirements. The plan was revised twice to meet reclamation requirements. During construction it was determined that a range fire, the previous year, had ignited a coal waste pile and the coal seam itself. This necessitated a change order for construction.
